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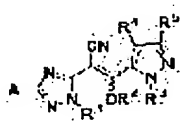
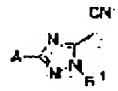
(54) ACRYLONITRILE COMPOUND

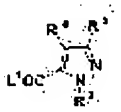
(57)Abstract:
PROBLEM TO BE SOLVED: To obtain a new acrylonitrille compound capable of exhibiting an excellent pest control activity and useful as a new insecticide or a new germicide.
SOLUTION: This acrylonitrile compound is represented by formula I (A is a 1-6C alkyl, a 2-6C alkenyl or the like; R1 is H, a 1-12C alkyl, a 2-12C alkenyl or the like; R2 is H, a 1-4C alkyl, a 2-4C alkoxyalkyl or the like; R3 is a 1-4C alkyl, a 2-4C alkenyl, a 1-4C haloalkyl or the like; R4 and R5 are each H, OH, SH, NH2, a halogen, a 1-4C alkyl or the like), e.g. 3-(1,4-dimethylpyrazol-5-yl)-3-hydroxy-2-(1-methyl-3-phenyl-1,2,4-triazol-5-yl)-acrylonitrile. The compound represented by formula I can be obtained by reacting a cyanomethyltriazole derivative represented by formula II with a carboxylic acid derivative represented by formula III (L1 is a leaving group) in the presence of a base and further reacting the resultant compound with a compound represented by formula IV (L2 is a leaving group).



I



II



III

IV

LEGAL STATUS

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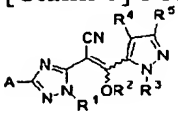
CLAIMS

[Claim(s)]
[Claim 1] Formula (1): [Formula 1]



A among [type C1 - C6 alkyl, C2 - C6 alkenyl, C1 - C6 halo alkyl, C3 which may be permuted by C1 - C4 alkyl - C7 cycloalkyl, It is the phenyl, the naphthyl, or pilus JINIRU which may be permuted by X. R1 H, C1 - C12 alkyl, C2 - C12 alkenyl, C1 - C12 halo alkyl, C3 which may be permuted by C1 - C4 alkyl - C7 cycloalkyl, C2 - C12 alkyl sulfenyl alkyl, C2 - C12 alkyl sulfinyl alkyl, C2 - C12 alkyl sulfonyl alkyl, C2 - C12 alkoxy alkyl, C1 permuted by phenyl - C3 alkyl, the phenyl which may be permuted by X, They are COORa, CONHRb, CONRaRb, CORa, or CO (N-piperidinyl). R2 -- H, C1 - C4 alkyl, C2 - C4 alkoxy alkyl, CH2SCH3, and CH2OC2H4 -- C1-C which were permuted by OCH3, Rc, or Rd -- 4 alkyl Tetrahydropyranyl, trimethylsilyl, SO2Re, SO2NHRb, SO2NRaRb, C(S) NHRb, C(S) NRaRb, CH2CO2Ra, C(O) Rf and P (O) RgRh, P(S) RgRh, alkali metal, They are alkaline earth metal or NHRiRjRk. X A halogen, C1 - C4 alkyl, C2 - C4 alkenyl, C1 - C4 halo alkyl, and C1 - C 4 alkoxy ** C1 - C4 haloalkoxy, C1 - C4 alkoxy alkyl, C1 - C4 alkyl sulfenyl, C1 - C4 alkyl sulfinyl, C1 - C4 alkyl sulfonyl, C1 - C4 halo alkyl sulfenyl, C1 - C4 halo alkyl sulfinyl, They are 1 thru/or three substituents chosen as arbitration from C1 - C4 halo alkyl sulfonyl, NO2 and CN, phenyl, and phenoxy. Respectively R4 and R5 independently H, OH, SH, NH2, a halogen, C1 - C4 alkyl, C2 - C4 alkenyl, C1 - C4 halo alkyl, and C1 - C 4 alkoxy ** C1 - C4 haloalkoxy, C1 - C4 alkoxy alkyl, C1 - C4 alkyl sulfenyl, C1 - C4 alkyl sulfinyl, C1 - C4 alkyl sulfonyl, C1 - C4 halo alkyl sulfenyl, C1 - C4 halo alkyl sulfinyl, They are C1 - C4 halo alkyl sulfonyl, and NO2 or CN. R3 C1 - C4 alkyl, They are C2 - C4 alkenyl, C1 - C4 halo alkyl, or C1 - C4 alkoxy alkyl. Ra is C1 - C6 alkyl, and Rb is the phenyl which may be permuted by H, C1 - C6 alkyl, or T1. Rc A halogen, C1 - C4 alkyl, C2 - C4 alkenyl, C1 - C4 halo alkyl, It is the phenyl which may be permuted by one or more sorts chosen as arbitration from C1 C4 alkoxy **C1 - C4 haloalkoxy, and C1 - C4 alkoxy alkyl. Rd A halogen, C1 - C4 alkyl, C2 - C4 alkenyl, C1 - C4 halo alkyl, It is the benzoyl which may be permuted by one or more sorts chosen as arbitration from C1 C4 alkoxy **C1 - C4 haloalkoxy, and C1 - C4 alkoxy alkyl. Re is the phenyl which may be permuted by C1 - C4 alkyl, C2 - C4 alkenyl, C1 - C4 halo alkyl, or T1. Rf C1 - C6 alkyl, C2 - C6 alkenyl, C1 - C6 halo alkyl, C2 - C4 alkoxy alkyl, C3 - C6 halo cycloalkyl, C1 permuted by Rc - C4 alkyl, C3 which may be permuted by C1 - C4 alkyl - C7 cycloalkyl, C3 permuted with cyclo propyl, Rc, and halogen which were permuted by Rc and C1 - C4 alkyl - C4 cycloalkyl, The cyclo propyl permuted by T2 and C1 - C4 alkyl, C2 permuted by Rc - C4 alkenyl, C1 C6 alkoxy **C1 - C4 haloalkoxy, C2 - C5 alkenyloxy, C3 which may be permuted by C1 - C4 alkyl - C6 cycloalkoxy, Benzyloxy one, COORa, -NU 1U2, the phenyl that may be permuted by T3, It is naphthyl, pilus JINIRU [which may be permuted by T1] or phenyl C1 - C6 alkyl. OH, C1 - C6 alkyl, and C1 - C6 alkoxy **** of Rg and Rh are C1 - C4 alkyl sulfenyl independently respectively. Respectively Ri, Rj, and Rk independently H, phenyl, C1 - C6 alkyl, [whether it is C3 - C6 cycloalkyl or benzyl which may be permuted by C1 - C4 alkenyl, C1 - C4 alkenyloxy, and C1 - C3 alkyl, and] Two in Ri, Rj, and Rk with the nitrogen atom which each has combined Or an oxygen atom, 5 thru/or 8 membered-ring radical which may contain the nitrogen atom or the sulfur atom may be formed. T1 A halogen, C1 - C4 alkyl, C1 - C4 halo alkyl or C1 - those with C4 alkoxy **, and T2 It is C2 which may be permuted with halogen - C4 alkenyl. T3 Halogen, C1 - C4 alkyl, C1 - C4 halo alkyl, and C1 - C 4 alkoxy ** C1 - C4 haloalkoxy, C1 - C4 alkyl SUFENIRU, C1 - C4 alkyl SUFINIRU, C1 - C4 alkyl SUFONIRU, C1 - C4 halo alkyl SUFENIRU, C1 - C4 halo alkyl SUFINIRU, C1

- C4 halo alkyl sulfonyl, They are 1 thru/or five substituents chosen as arbitration from NO2, CN, CHO, - NU 1U2, phenyl, and phenoxy. U1 and U2 5 thru/or 8 membered-ring radical which may contain the oxygen atom, the nitrogen atom, or the sulfur atom with the nitrogen atom which expressed H, C1 - C6 alkyl, COORa, phenyl, or benzyl, or U1 and U2 have combined may be formed independently respectively.] The acrylonitrile compound come out of and expressed.

[Claim 2] It is the acrylonitrile compound according to claim 1 whose R3 A is phenyl, R1 is C1 - C6 alkyl, R2 is H or C(O) Rf, and is C1 - C6 alkyl, whose R5 R4 is H, a halogen, C1 - C6 alkyl, or C1 - those with C6 alkoxy **, and is H or C1 - C6 alkyl and whose Rf is C1 - C6 alkyl.

[Claim 3] It is the acrylonitrile compound according to claim 2 whose R4 R1 is methyl or normal hexyl, R3 is methyl, and is H, a chlorine atom, methyl, or methoxy, whose R5 is H, methyl, or ethyl and whose Rf is tertiary butyl.

[Claim 4] It is the acrylonitrile compound according to claim 1 whose R4 A is phenyl, R1 is C1 - C6 alkyl, R2 is H or C(O) Rf, R3 is C1 - C6 alkyl, and is H, a halogen, or C1 - C6 alkyl, whose R5 is H or C1 - C6 alkyl and whose Rf is C1 - C6 alkyl.

[Claim 5] It is the acrylonitrile compound according to claim 4 whose R4 R1 is methyl or normal hexyl, R3 is methyl, and is H, a chlorine atom, or methyl, whose R5 is H or methyl and whose Rf is tertiary butyl.

[Claim 6] The agricultural chemicals characterized by containing one or more sorts of an acrylonitrile compound according to claim 1 to 5 as an active principle.

[Translation done.]

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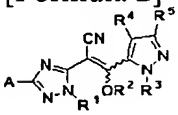
DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] This invention relates to the agricultural chemicals characterized by containing a new acrylonitrile compound and this compound as an active principle. The agricultural chemicals in this invention are an insecticide, miticide, a nematicide, a herbicide, a germicide, etc., and are the insecticide of a plantation art, a zootechnics, and the health field, miticide, and a nematicide especially.
[0002]
[Description of the Prior Art] About the acrylonitrile derivative as agricultural chemicals, WO 97/40009 and WO 98/42683 have a publication.
[0003]
[Problem(s) to be Solved by the Invention] By use over the many years of an insecticide or a germicide, a pest acquires resistance and prevention by a conventional insecticide and a conventional germicide is difficult in recent years. Therefore, the technical problem of this invention is to offer the new insecticide in which the outstanding pest control activity is shown, and a germicide.
[0004]
[Means for Solving the Problem] this invention persons completed header this invention for the pest control activity excellent in the following compound being shown, as a result of continuing research, in order to solve the above-mentioned technical problem.
[0005] That is, this invention relates to the agricultural chemicals which contain this compound of a publication as an active principle in following [1]- [a compound (this invention compound is called hereafter.) given in 5], and following [6].
[0006] [1] Formula (1) : [0007]
[Formula 2]



[0008] A among [type C1 - C6 alkyl, C2 - C6 alkenyl, C1 - C6 halo alkyl, C3 which may be permuted by C1 - C4 alkyl - C7 cycloalkyl, It is the phenyl, the naphthyl, or pilus JINIRU which may be permuted by X. R1 H, C1 - C12 alkyl, C2 - C12 alkenyl, C1 - C12 halo alkyl, C3 which may be permuted by C1 - C4 alkyl - C7 cycloalkyl, C2 - C12 alkyl sulfenyl alkyl, C2 - C12 alkyl sulfinyl alkyl, C2 - C12 alkyl sulfonyl alkyl, C2 - C12 alkoxy alkyl, C1 permuted by phenyl - C3 alkyl, the phenyl which may be permuted by X, They are COORa, CONHRb, CONRaRb, CORa, or CO (N-piperidinyl). R2 -- H, C1 - C4 alkyl, C2 - C4 alkoxy alkyl, CH2SCH3, and CH2OC2H4 -- C1-C which were permuted by OCH3, Rc, or Rd -- 4 alkyl Tetrahydropyranyl, trimethylsilyl, SO2Re, SO2NHRb, It is SO2NRaRb, C(S) NHRb, C(S) NRaRb, CH2CO2Ra, C(O) Rf and P (O) RgRh, P(S) RgRh, alkali metal, alkaline earth metal, or NHRiRjRk, and is [0009]. X A halogen, C1 - C4 alkyl, C2 - C4 alkenyl, C1 - C4 halo alkyl, C1 C4 alkoxy **C1 - C4 haloalkoxy, C1 - C4 alkoxy alkyl, C1 - C4 alkyl sulfenyl, C1 - C4 alkyl sulfinyl, C1 - C4 alkyl sulfonyl, C1 - C4 halo alkyl sulfenyl, C1 - C4 halo alkyl sulfinyl, C1 - C4 halo alkyl sulfonyl, They are 1 thru/or three substituents chosen as arbitration from NO2, CN, phenyl, and phenoxy. Respectively R4 and R5 independently H, OH, SH, NH2, a halogen, C1 - C4 alkyl, C2 - C4 alkenyl, C1 - C4 halo alkyl, and C1 - C 4 alkoxy ** C1 - C4 haloalkoxy, C1 - C4 alkoxy alkyl, C1 - C4 alkyl sulfenyl, C1 - C4 alkyl sulfinyl, C1 - C4 alkyl sulfonyl, C1 - C4 halo alkyl sulfenyl, C1 - C4 halo alkyl sulfinyl, It is C1 - C4 halo alkyl sulfonyl, and NO2 or CN, R3 is C1 - C4 alkyl, C2 - C4 alkenyl, C1 - C4 halo alkyl, or C1 - C4 alkoxy alkyl, and it is

[0010]. Ra is C1 - C6 alkyl, and Rb is the phenyl which may be permuted by H, C1 - C6 alkyl, or T1. Rc A halogen, C1 - C4 alkyl, C2 - C4 alkenyl, C1 - C4 halo alkyl, It is the phenyl which may be permuted by one or more sorts chosen as arbitration from C1 C4 alkoxy **C1 - C4 haloalkoxy, and C1 - C4 alkoxy alkyl. Rd A halogen, C1 - C4 alkyl, C2 - C4 alkenyl, C1 - C4 halo alkyl, It is the benzoyl which may be permuted by one or more sorts chosen as arbitration from C1 C4 alkoxy **C1 - C4 haloalkoxy, and C1 - C4 alkoxy alkyl. Re is the phenyl which may be permuted by C1 - C4 alkyl, C2 - C4 alkenyl, C1 - C4 halo alkyl, or T1, and is [0011]. Rf C1 - C6 alkyl, C2 - C6 alkenyl, C1 - C6 halo alkyl, C2 - C4 alkoxy alkyl, C3 - C6 halo cycloalkyl, C1 permuted by Rc - C4 alkyl, C3 which may be permuted by C1 - C4 alkyl - C7 cycloalkyl, C3 permuted with cyclo propyl, Rc, and halogen which were permuted by Rc and C1 - C4 alkyl - C4 cycloalkyl, The cyclo propyl permuted by T2 and C1 - C4 alkyl, C2 permuted by Rc - C4 alkenyl, C1 C6 alkoxy **C1 - C4 haloalkoxy, C2 - C5 alkenyloxy, C3 which may be permuted by C1 - C4 alkyl - C6 cycloalkoxy, Benzyloxy one, COORa, -NU 1U2, the phenyl that may be permuted by T3, It is naphthyl, pilus JINIRU [which may be permuted by T1] or phenyl C1 - C6 alkyl, Rg and Rh are C1 - C4 alkyl sulfenyl independently respectively, and OH, C1 - C6 alkyl, and C1 - C6 alkoxy **** are [0012]. Respectively Ri, Rj, and Rk independently H, phenyl, C1 - C6 alkyl, [whether it is C3 - C6 cycloalkyl or benzyl which may be permuted by C1 - C4 alkenyl, C1 - C4 alkenyloxy, and C1 - C3 alkyl, and] Two in Ri, Rj, and Rk with the nitrogen atom which each has combined Or an oxygen atom, 5 thru/or 8 membered-ring radical which may contain the nitrogen atom or the sulfur atom may be formed. T1 A halogen, C1 - C4 alkyl, C1 - C4 halo alkyl or C1 - those with C4 alkoxy **, and T2 are C2 which may be permuted with halogen - C4 alkenyl, and are [0013]. T3 A halogen, C1 - C4 alkyl, C1 - C4 halo alkyl, C1 C4 alkoxy **C1 - C4 haloalkoxy, C1 - C4 alkyl SUFENIRU, C1 - C4 alkyl SUFINIRU, C1 - C4 alkyl SUFONIRU, C1 - C4 halo alkyl SUFENIRU, C1 - C4 halo alkyl SUFINIRU, C1 - C4 halo alkyl sulfonyl, They are 1 thru/or five substituents chosen as arbitration from NO2, CN, CHO, -NU 1U2, phenyl, and phenoxy. U1 and U2 5 thru/or 8 membered-ring radical which may contain the oxygen atom, the nitrogen atom, or the sulfur atom with the nitrogen atom which expressed H, C1 - C6 alkyl, COORa, phenyl, or benzyl, or U1 and U2 have combined may be formed independently respectively.] The acrylonitrile compound come out of and expressed.

[0014] [2] It is the acrylonitrile compound of the above-mentioned [1] publication whose R3 A is phenyl, R1 is C1 - C6 alkyl, R2 is H or C(O) Rf, and is C1 - C6 alkyl, whose R5 R4 is H, a halogen, C1 - C6 alkyl, or C1 - those with C6 alkoxy **, and is H or C1 - C6 alkyl and whose Rf is C1 - C6 alkyl.

[0015] [3] It is the acrylonitrile compound of the above-mentioned [2] publication whose R4 R1 is methyl or normal hexyl, R3 is methyl, and is H, a chlorine atom, methyl, or methoxy, whose R5 is H, methyl, or ethyl and whose Rf is tertiary butyl.

[0016] [4] It is the acrylonitrile compound of the above-mentioned [1] publication whose R4 A is phenyl, R1 is C1 - C6 alkyl, R2 is H or C(O) Rf, R3 is C1 - C6 alkyl, and is H, a halogen, or C1 - C6 alkyl, whose R5 is H or C1 - C6 alkyl and whose Rf is C1 - C6 alkyl.

[0017] [5] It is the acrylonitrile compound of the above-mentioned [4] publication whose R4 R1 is methyl or normal hexyl, R3 is methyl, and is H, a chlorine atom, or methyl, whose R5 is H or methyl and whose Rf is tertiary butyl.

[0018] [6] The agricultural chemicals characterized by containing one or more sorts of an acrylonitrile compound given [above-mentioned] in [1]- [5] as an active principle.

[0019]

[Embodiment of the Invention] -C(CN) =C(OR2)- of this invention compound (1) As for the section, both are contained in this invention, although two sorts of isomers, E bodies and Z body, exist when R2 is except a hydrogen atom. Moreover, these are also contained in this invention, although a tautomer exists when R2 is a hydrogen atom.

[0020] Next, A, R1, R2, R3, R4, R5, X, Ra, Rb, Rc, Rd, Re, Rf, Rg, Rh, Ri, Rj, Rk, T1, T2, T3, and the desirable range of U1 and U2 are explained.

[0021] The range of desirable A is a group shown below. Namely, the phenyl, naphthyl, or pilus JINIRU which may be permuted by AI:C1 - C6 alkyl and X. AII : Phenyl which may be permuted by C1 - C6 alkyl and X.

[0022] The desirable range of R1 is a group shown below. R1 I:H, C1 - C12 alkyl, C2 - C12 alkyl sulfenyl alkyl, C2 - C12 alkoxy alkyl, C1 permuted by phenyl - C3 alkyl. R1 II:H, C1 - C12 alkyl.

[0023] The desirable range of R2 is a group shown below. R -- two -- I:H -- C -- one - C -- four -- alkyl -- C -- two - C -- four -- alkoxy one -- alkyl -- CH -- two -- OC -- two -- H -- four -- OCH -- three -- SO -- two -- Re -- SO -- two -- NHRb -- SO -- two -- NRaRb -- C -- (-- S --) -- NHRb -- C -- (-- S --) -- NRaRb -- CH --

two -- CO -- two -- Ra -- C -- (-- O --) -- Rf -- alkali metal -- alkaline earth metal -- NHRiRjRk . R -- two -- II:H -- C -- one - C -- four -- alkyl -- C -- two - C -- four -- alkoxy one -- alkyl -- SO -- two -- Re -- C -- (-- O --) -- Rf -- alkali metal -- alkaline earth metal -- NHRiRjRk . R2 III:H, C1 - C4 alkyl, C2 - C4 alkoxy alkyl, and SO2 -- Re and C (O) -- Rf .

[0024] The desirable range of R3 is a group shown below. R3 I:C1 - C4 alkyl, C1 - C4 alkoxy alkyl. R3 II:C1 - C4 alkyl.

[0025] The desirable range of R4 is a group shown below. R4 I:H, OH, SH and NH2, a halogen, C1 - C4 alkyl, C1 C4 alkoxy **C1 - C4 haloalkoxy, C1 - C4 alkoxy alkyl. R4 II:H, OH, a halogen, C1 - C4 alkyl.

[0026] The desirable range of R5 is a group shown below. R5 I:H, OH, SH and NH2, a halogen, C1 - C4 alkyl, C1 C4 alkoxy **C1 - C4 haloalkoxy, C1 - C4 alkoxy alkyl. R5 II:H, OH, a halogen, C1 - C4 alkyl.

[0027] The range of desirable X is a group shown below. Namely, XI: 1 thru/or three substituents chosen as arbitration from a halogen, C1 - C4 alkyl, C1 - C4 halo alkyl, and C1 - C4 alkoxy **** phenyl. XII: 1 thru/or two substituents chosen as arbitration from a halogen, C1 - C4 alkyl, C1 - C4 halo alkyl, and C1 - C4 alkoxy **** phenyl.

[0028] The range of desirable Ra is a group shown below. Namely, RaI:C1 - C4 alkyl.

[0029] The desirable range of Rb is a group shown below. Namely, RbI:C1 - C6 alkyl, phenyl which may be permuted by T1.

[0030] The desirable range of Rc is a group shown below. Namely, RcI: A halogen, C1 - C4 alkyl, phenyl that may be permuted by C1 - C4 ARUKOKISHI.

[0031] The desirable range of Rd is a group shown below. Namely, RdI: Benzoyl which may be permuted by the halogen and C1 - C4 alkyl.

[0032] The range of desirable Re is a group shown below. Namely, ReI:C1 - C4 alkyl, phenyl which may be permuted by T1.

[0033] The range of desirable Rf is a group shown below. Namely, phenyl which may be permuted by RfI:C1 - C6 alkyl, C2 - C6 alkenyl, C1 - C6 halo alkyl, C2 - C4 alkoxy alkyl, C3 which may be permuted by C1 - C3 alkyl - C6 cycloalkyl, C1 C6 alkoxy **C3 - C6 cycloalkoxy, and T3. Phenyl which may be permuted by C3 - C6 cycloalkyl, and C1 - C6 alkoxy **T3 which may be permuted by RfII:C1 - C6 alkyl and C1 - C3 alkyl.

[0034] The desirable range of Rg is a group shown below. That is, RgI:OH, and C1 - C6 alkoxy **** are C1 - C4 alkyl sulfenyl.

[0035] The desirable range of Rh is a group shown below. Namely, RhI:C1 C6 alkoxy **C1 - C4 alkyl sulfenyl.

[0036] The desirable range of Ri is a group shown below. That is, 5 thru/or 6 membered-ring radical on which it is RiI:H, C1 - C6 alkyl, C3 - C6 cycloalkyl, or benzyl, or Ri and Rj may contain the oxygen atom, the nitrogen atom, or the sulfur atom with the nitrogen atom which each has combined may be formed.

[0037] The desirable range of Rj is a group shown below. That is, 5 thru/or 6 membered-ring radical on which it is RjI:H, C1 - C6 alkyl, C3 - C6 cycloalkyl, or benzyl, or Ri and Rj may contain the oxygen atom, the nitrogen atom, or the sulfur atom with the nitrogen atom which each has combined may be formed.

[0038] The desirable range of Rk is a group shown below. Namely, RkI:H, C1 - C6 alkyl.

[0039] The desirable range of U1 is a group shown below. Namely, U1 I:H, C1 - C6 alkyl, COORa, phenyl, or benzyl.

[0040] The desirable range of U2 is a group shown below. Namely, U2 I:H, C1 - C6 alkyl, COORa, phenyl, or benzyl.

[0041] The desirable range of T1 is a group shown below. Namely, T1I: A halogen, C1 - C4 alkyl, C1 - C4 halo alkyl.

[0042] The range of desirable T3 is a group shown below. Namely, T3I: 1 thru/or three substituents chosen as arbitration from a halogen, C1 - C4 alkyl, C1 - C4 halo alkyl, C1 C4 alkoxy **C1 - C4 haloalkoxy, C1 - C4 alkyl sulfenyl, C1 - C4 alkyl sulfinyl, C1 - C4 alkyl sulfonyl, and -NU 1U2. T3 II: 1 thru/or three substituents chosen as arbitration from halogen, C1 - C4 alkyl, C1 - C4 halo alkyl, and C1 - C 4 ARUKOKISHI.

[0043] Each group in the range of an above-mentioned desirable substituent is combinable with arbitration, respectively.

[0044] Next, the example of each atom in A, R1, R2, R3, R4, R5, X, Ra, Rb, Rc, Rd, Re, Rf, Rg, Rh, Ri, Rj, Rk, T1, T2, T3, and the definition of U1 and U2 and a radical is shown.

[0045] As R4, R5, X, Rc, Rd, T1, T2, and a halogen atom in the definition of T3, a fluorine atom, a chlorine atom, a bromine atom, and an iodine atom are raised, and a fluorine atom, a chlorine atom, and a bromine

atom are raised preferably.
[0046] As A, R1, R2, R3, R4, R5, X, Ra, Rb, Rc, Rd, Re, Rf, Rg, Rh, Ri, Rj, Rk, T1, T3, and alkyl in the definition of U1 and U2 As alkyl of a straight chain or the letter of branching, methyl, ethyl, n-propyl, Isopropyl, n-butyl, isobutyl, tert-butyl, sec-butyl, Pentyl -1, pentyl -2, pentyl -3, 2-methylbutyl -1, 2-methylbutyl -2, 2-methylbutyl -3, 3-methylbutyl - 1, 2, and 2-dimethyl propyl -1, hexyl -1, hexyl -2, hexyl -3, 1-methyl pentyl, 2-methyl pentyl, 3-methyl pentyl, 4-methyl pentyl, 1, and 1-dimethyl butyl, 1, 2-dimethyl butyl, 1, 3-dimethyl butyl, 2, and 2-dimethyl butyl, 2, 3-dimethyl butyl, 3, and 3-dimethyl butyl, 1-ethyl butyl, 2-ethyl butyl, 1 and 1, 2-trimethyl propyl, 1 and 2, 2-trimethyl propyl, 1-ethyl-1-methylpropyl, 1-ethyl-2-methylpropyl, etc. are raised, and it is chosen in the range of the carbon number of each assignment.
[0047] As A, R1, R3, R4, R5, X, Rc, Rd, Re, Rf, T1, and halo alkyl in the definition of T3 As halo alkyl of a straight chain or the letter of branching, fluoro methyl, chloro methyl, Bromomethyl, fluoro ethyl, chloro ethyl, BUROMO ethyl, fluoro-n-propyl, Chloro-n-propyl, difluoromethyl, chlorodifluoromethyl, Trifluoromethyl, dichloro methyl, TORIKURORO methyl, difluoro ethyl, Trifluoro ethyl, trichloroethyl, chlorodifluoromethyl, BUROMO difluoromethyl, trifluoro chloro ethyl, hexafluoro-n-propyl, chlorobutyl, fluoro butyl, etc. are raised, and it is chosen from the range of the carbon number of each assignment.
[0048] As cycloalkyl in the definition of A, R1, Rf, Ri, Rj, and Rk, cyclo propyl, 1-methyl cyclo propyl, 2, 2 and 3, 3-tetramethyl cyclo propyl, cyclo butyl, 1-ethyl cyclo butyl, 1-n-butyl cyclo butyl, cyclopentyl, 1-methyl cyclopentyl, cyclohexyl, 1-methylcyclohexyl and 4-methylcyclohexyl, cycloheptyl one, etc. are raised.
[0049] As C1 permuted by Rc in the definition of Rf - C4 alkyl Benzyl, 2-chloro benzyl, 3-BUROMO benzyl, 4-chloro benzyl, 4-methylbenzyl, 4-tert-butyl benzyl, 2-methylbenzyl, 2-methoxybenzyl, 1-phenylethyl, 1-(3-chlorophenyl) ethyl, 2-phenylethyl, 1-methyl-1-phenylethyl, a 1-(4-chlorophenyl)-1-methylethyl, A 1-(3-chlorophenyl)-1-methylethyl, 1-phenylpropyl, 2-phenylpropyl, 3-phenylpropyl, 1-phenyl butyl, 2-phenyl butyl, 3-phenyl butyl, 4-phenyl butyl, 1-methyl-1-phenylpropyl, 1-methyl-2-phenylpropyl, 1-methyl-3-phenylpropyl, 2-methyl-2-phenylpropyl, 2-(4-chlorophenyl)-2-methyl-propyl, and 2-methyl -2 -(3-methylphenyl)- Propyl etc. is raised.
[0050] As phenyl which may be permuted by T1 in the definition of Rb and Re Phenyl, 2-fluoro phenyl, 3-fluoro phenyl, 4-fluoro phenyl, 2-chlorophenyl, 3-chlorophenyl, 4-chlorophenyl, 2-BUROMO phenyl, 3-BUROMO phenyl, 4-BUROMO phenyl, 4-iodine phenyl, 2, 4-dichlorophenyl, 3, 4-dichlorophenyl, 2, 6-difluoro phenyl, 2, 6-dichlorophenyl, 2-fluoro-4-chlorophenyl, 2, 3, 4 and 5, 6-pentafluorophenyl, 2-methylphenyl, 3-methylphenyl, 4-methylphenyl, 2, 5-dimethylphenyl, 4-methyl - 2, 3, 5, 6-tetrafluoro phenyl, 2-methoxypheny, 3-methoxypheny, 4-methoxypheny, 2, 6-methoxypheny, 3 and 4-dimethoxy phenyl and 3 and 4, 5-trimethoxyphenyl, 2-trifluoro methylphenyl, 3-trifluoro methylphenyl, 4-trifluoro methylphenyl, etc. are raised.
[0051] it can set to the definition of R4, R5, X, Rc, Rd, Rf, Rg, Rh, T1, and T3, if alkoxy ** is carried out A straight chain or branched-chain carry out alkoxy **. Methoxy and ethoxy **n-propoxy, Isopropoxy, n-butoxy, iso butoxy, sec-butoxy, tert-butoxy, n-pentyloxy, 1-methylbutyloxy, 2-methylbutyloxy, 3-methylbutyloxy, 1, and 1-dimethyl propoxy, 1, 2-dimethyl propoxy, 2, and 2-dimethyl propoxy, 1-ethyl propyloxy, n-hexyloxy, 1-methyl pentyloxy, 2-methyl pentyloxy, 3-methyl pentyloxy, 4-methyl pentyloxy, 1, and 1-dimethyl butyloxy, 1, 2-dimethyl butyloxy, 1, 3-dimethyl butyloxy, 2, and 2-dimethyl butyloxy radical, 2, 3-dimethyl butyloxy radical, 3, and 3-dimethyl butyloxy, 1-ethyl butyloxy, 2-ethyl butyloxy, 1 and 1, 2-trimethyl propyloxy, 1, 2, and 2-trimethyl propyloxy, 1-ethyl-1-methyl propyloxy, 1-ethyl-2-methyl propyloxy, etc. are raised, and it is chosen from the range of the carbon number of each assignment.
[0052] It can set to the definition of Rf and T3. - As NU 1U2, methylamino, ethylamino, n-propylamino, isopropylamino, n-butylamino, isobutyl amino, sec-butylamino, tert-butylamino, n-pentylamino, 1-methylbutylamino, 2-methylbutylamino, 3-methylbutylamino, 1 and 1-dimethyl propylamino, 1, 2-dimethyl propylamino, 2 and 2-dimethyl propylamino, 1-ethyl propylamino, n-hexylamino, 1-methyl pentylamino, 2-methyl pentylamino, 3-methyl pentylamino, 4-methyl pentylamino, 1, and 1-dimethyl butylamino, 1, 2-dimethyl butylamino, 1, 3-dimethyl butylamino, 2, and 2-dimethyl butylamino, 2, 3-dimethyl butylamino, 3 and 3-dimethyl butylamino, 1-ethyl butylamino, 2-ethyl butylamino, 1, 1, 2-trimethyl propylamino, 1 and 2, 2-trimethyl propylamino, 1-ethyl-1-methylpropyl amino, dimethylamino, diethylamino, G n-propylamino, diisopropylamino, G n-butylamino, G sec-butylamino, diisobutyl amino, G n-pentylamino, G n-hexylamino, methylethylamino, methylpropyl amino, Methyl isopropylamino, methylbutylamino, methyl-sec-butylamino, Methyl isobutyl amino, methyl-tert-butylamino, methyl pentylamino, Methyl hexylamino, ethyl propylamino, ethyl isopropylamino, Ethyl butylamino, ethyl-sec-butylamino, ethyl isobutyl amino, Ethyl

pentylamino, ethylhexyl amino, phenylamino, benzylamino, N-methyl acetamide, N-ethyl acetamide, an N-phenyl acetamide N-acetyl acetamide, etc. are raised, and it is chosen in the range of the carbon number of each assignment.

[0053] As haloalkoxy in the definition of R4, R5, X, Rc, Rd, Rf, and T3 The shape of a straight chain and branched-chain haloalkoxy are raised respectively. Fluoro methoxy, Difluoro methoxy, trifluoro methoxy, chloro difluoro methoxy, BUROMO difluoro methoxy, dichloro fluoro methoxy, chloro methoxy, Dichloro methoxy, TORIKURORO methoxy, BUROMO methoxy, fluoroethoxy, Chloroethoxy, bromoethoxy, difluoroethoxy, trifluoroethoxy, Tetrafluoro ethoxy ** pentafluoro ethoxy ** TORIKUROROETOKI, Trifluoro chloroethoxy, fluoro propoxy, chloro propoxy, BUROMO propoxy, fluoro butoxy, chloro butoxy, fluoro-iso-propoxy, chloro-iso-propoxy, etc. are raised.

[0054] As R1, R4, R5, X, Rg, Rh, and alkyl sulfenyl in the definition of T3, a methylthio, ethyl thio, n-propyl thio, iso-propyl thio, n-butyl thio, iso-butyl thio, sec-butyl thio, tert-butyl thio, etc. are raised.

[0055] As R1, R4, R5, X, and alkyl sulfinyl in the definition of T3, methyl sulfinyl, ethyl sulfinyl, n-propyl sulfinyl, iso-propyl sulfinyl, n-butyl sulfinyl, iso-butyl sulfinyl, sec-butyl sulfinyl, tert-butyl sulfinyl, etc. are raised.

[0056] As R1, R4, R5, X, and alkyl sulfonyl in the definition of T3, a methylsulfonyl, ethyl sulfonyl, n-propyl sulfonyl, iso-propyl sulfonyl, n-butyl sulfonyl, iso-butyl sulfonyl, sec-butyl sulfonyl, tert-butyl sulfonyl, etc. are raised.

[0057] As alkoxy alkyl in the definition of R1, R2, R3, R4, R5, X, Rc, Rd, and Rf, methoxymethyl methyl, ethoxy methyl, n-propoxy methyl, iso-propoxy methyl, n-butoxy methyl, iso-butoxy methyl, sec-butoxy methyl, tert-butoxy methyl, n-pentyl oxymethyl, methoxy ethyl, ethoxy methyl, methoxy propyl, etc. are raised, and it is respectively chosen from the range of the appointed carbon number.

[0058] 1-naphthyl and 2-naphthyl are raised as naphthyl in the definition of A and Rf.

[0059] As pilus JINIRU which may be permuted by T1 in the definition of R2 4-pyridyl which may be permuted by 2-pyridyl which may be permuted by T1, 3-pyridyl which may be permuted by T1, and T1 is raised. It is 2-pyridyl which may be permuted by 2-pyridyl which may be preferably permuted by T1, and T1, and is 3-pyridyl which may be more preferably permuted by T1.

[0060] As R4, R5, X, and halo alkyl sulfenyl in the definition of T3, a fluoro methylthio, a chloro difluoro methylthio, a BUROMO difluoro methylthio, a trifluoro methylthio, a TORIKURORO methylthio, 2 and 2, 2-trifluoro ethyl thio, 1, 1 and 2, 2-tetrafluoro ethyl thio, fluoro ethyl thio, pentafluoro ethyl thio, a fluoro-iso-propyl thio radical, etc. are raised as the shape of a straight chain, and branched-chain halo alkylthio.

[0061] As R4, R5, X, and halo alkyl sulfinyl in the definition of T3, fluoro methyl sulfinyl, chlorodifluoromethyl sulfinyl, BUROMO difluoromethyl sulfinyl, trifluoromethyl sulfinyl, TORIKURORO methyl sulfinyl, 2 and 2, 2-trifluoro ethyl sulfinyl, 1, 1 and 2, 2-tetrafluoro ethyl sulfinyl, fluoro ethyl sulfinyl, pentafluoro ethyl sulfinyl, fluoro-iso-propyl sulfinyl, etc. are raised as the shape of a straight chain, and branched-chain halo alkyl sulfinyl.

[0062] As R4, R5, X, and halo alkyl sulfonyl in the definition of T3, a fluoro methylsulfonyl, chlorodifluoromethyl sulfonyl, BUROMO difluoromethyl sulfonyl, trifluoromethyl sulfonyl, a TORIKURORO methylsulfonyl, 2 and 2, 2-trifluoro ethyl sulfonyl, 1, 1 and 2, 2-tetrafluoro ethyl sulfonyl, fluoro ethyl sulfonyl, pentafluoro ethyl sulfonyl, fluoro-iso-propyl sulfonyl, etc. are raised as the shape of a straight chain, and branched-chain halo alkyl sulfonyl.

[0063] As alkenyloxy in the definition of Rf, Ri, Rj, and Rk, allyloxy, 2-propenyloxy, 2-butenyl oxy-**** 2-methyl-2-propenyloxy, etc. are raised as alkenyloxy of C2 - C4 straight chain or the letter of branching.

[0064] As alkenyl in the definition of A, R1, X, R3, R4, R5, Ri, Rj, and Rk, an allyl compound, 2-propenyl, 2-butenyl, 2-methyl-2-propenyl, 4-methyl-3-pentenyl, 2-hexenyl, etc. are raised, and it is respectively chosen with the appointed carbon number.

[0065] A lithium, sodium, and a potassium are raised as an alkali metal in the definition of R2.

[0066] As an alkaline earth metal in the definition of R2, magnesium, calcium, strontium, or barium is raised and magnesium, calcium, or barium is raised preferably.

[0067] As ammonium shown by NHRiRjRk in the definition of R2 Ammonium, monomethyl ammonium, a dimethylannmonium radical, A trimethylammonium radical, diethyl ammonium, triethyl ammonium, Diisopropyl ammonium, a diisopropyl ethylammonium radical, A hexyl methylammonium radical, cyclopropyl methyl ammonium, A cyclohexyl methylammonium radical, an allyl compound methylammonium radical, To a benzyl methylammonium radical or 4-methyl cyclo [whether it is a KISHIRU ethylammonium radical and] Or heterocycle type 5 membered-ring in which two in Ri, Rj, and Rk may contain an oxygen atom, a nitrogen atom, or a sulfur atom with the nitrogen atom which each has

combined, six membered-rings, seven membered-rings, or 8 membered-ring ammonium is raised.
[0068] As the heterocycle type 5 at which two in Ri, Rj, and Rk in the definition of Ri, Rj, and Rk may contain the oxygen atom, the nitrogen atom, or the sulfur atom with the nitrogen atom which each has combined thru/or 8 membered-ring ammonium, a pyrrolidine, pyrazolidine, imidazolidine, oxazolidine, iso oxazolidine, thiazolidine, a piperidine, a piperazine, a morpholine, a thia morpholine, hexamethyleneimine, and heptamethyleneimine are raised.
[0069] As the heterocycle type 5 which may contain the oxygen atom, the nitrogen atom, or the sulfur atom with the nitrogen atom which U1 and U2 in the definition of U1 and U2 have combined thru/or eight membered-rings, a pyrrolidine, pyrazolidine, imidazolidine, oxazolidine, iso oxazolidine, thiazolidine, a piperidine, a piperazine, a morpholine, a thia morpholine, hexamethyleneimine, and heptamethyleneimine are raised.
[0070] As C3 - C6 halo cycloalkyl in the definition of Rf, fluoro cyclo propyl, difluoro cyclo propyl, chloro cyclo propyl, dichloro cyclo propyl, the 1-methyl -2, 2-dichloro cyclo propyl, chloro cyclo butyl, dichloro cyclo butyl, chloro cyclopentyl, dichloro cyclopentyl, chloro cyclohexyl, dichloro cyclohexyl, tetrafluoro cyclo butyl, etc. are raised.
[0071] As cyclo propyl permuted by T2 and C1 - C4 alkyl in the definition of Rf 2 and 2-dimethyl -3 -(2 and 2-dimethyl ethenyl)- Cyclo propyl, 3-(2 and 2-dibromo ethenyl)-2 and 2-dimethyl cyclo propyl, 3-(2 and 2-dichloroethenyl)-2, and 2-dimethyl cyclo propyl, 3-(2 and 2-chloro trifluoro ethenyl)-2, and 2-dimethyl cyclo propyl etc. is raised.
[0072] As C3 which may be permuted by C1 - C4 alkyl in the definition of Rf - a C6 cycloalkoxy radical, a cyclo propoxy group, a cyclo butoxy radical, a cyclo pentoxy radical, a cyclohexyloxy radical, 1-methyl cyclo pro PIKISHI radical, etc. are raised.
[0073] As C3 permuted by Rc and halogen atom in definition of Rf - C4 cycloalkyl 2 and 2-dichloro-1-phenyl cyclo propyl, 2, and 2-dichloro -1 -(3-chlorophenyl)- Cyclo propyl, 2 and 2-dichloro -1 -(4-methoxypheny)- Cyclo propyl, 2 and 2-dichloro -1 -(4-ethoxy phenyl)- Cyclo propyl, 2 and 2-dichloro -1 -(4-iso-propyloxy phenyl)- Cyclo propyl, 2 and 2-dichloro -1 -(4 -- t-buthylphenyl)- Cyclo propyl, 2, 2-dichloro-1-(4-methoxypheny)-3-phenyl cyclo propyl, 1-(4-ethoxy phenyl)-2, 2 and 3, 3-tetrafluoro butyl, etc. are raised.
[0074] As a cyclo propyl group permuted by the alkyl group of Rc and carbon numbers 1-4 in the definition of Rf 2 and 2-dimethyl-1-phenyl cyclo propyl group, 1-(4-chlorophenyl)-2, and 2-dimethyl cyclo propyl group, 2 and 2-dimethyl-3-phenyl cyclo propyl group, 3-(3-chlorophenyl)-2, and 2-dimethyl cyclo propyl group, (4-chlorophenyl) -2 and 2-dimethyl-3-phenyl cyclo propyl group, (4-BUROMO phenyl) -2 and 2-dimethyl-3-phenyl cyclo propyl group, 2, and 2-dimethyl -3 -(4-methylphenyl)- A cyclo propyl group, (4-tert-buthylphenyl)-2, and 2-dimethyl-3-phenyl cyclo propyl group etc. is raised.
[0075] As C3 permuted by Rc in the definition of Rf - C6 cycloalkyl 1-phenyl cyclo propyl, 1 -(3-chlorophenyl)- Cyclo propyl, 1 -(4-chlorophenyl)- Cyclo propyl, 1 -(4-BUROMO phenyl)- Cyclo propyl, 1 -(4-fluoro phenyl)- Cyclo propyl, 1 -(4-ethyl phenyl)- Cyclo propyl, 1 -(4-propyl phenyl)- Cyclo propyl, 2-phenyl cyclo propyl, 1-phenyl cyclo butyl, 2-phenyl cyclo butyl, 1-phenyl cyclopentyl, 1 -(4-chlorophenyl)- Cyclopentyl, 2-phenyl cyclopentyl, 3-phenyl cyclopentyl, 1-phenyl cyclohexyl, 1 -(3-fluoro phenyl)- Cyclohexyl, 1 -(4-chlorophenyl)- Cyclohexyl 1 -(4-tert-buthylphenyl)- Cyclohexyl, 2-phenyl cyclohexyl, 3-phenyl cyclohexyl, 4-phenyl cyclohexyl, etc. are raised.
[0076] this invention compound can be prevented at low concentration effectively [any noxious insect of the so-called stored product insect which injures the so-called medically important insect which has various bad influences by the living environment of human beings, such as the so-called agricultural noxious insect which injures plantation art crops, a tree, etc., the so-called livestock noxious insect which is parasitic on domestic animals, and a house, the grain stored in the warehouse and Acari which carries out generating injury in the same scene, Nematoda, a mollusk, and crustacean].
[0077] Although there are some which are specifically shown below in the Insecta which can be prevented using this invention compound, Acari, Nematoda, a mollusk, and crustacean, they are not those things limited to seeing.
[0078] Chilo, Cnaphalocrocis medinalis, free-wheel-plate OBIKOYAGA, ICHIMONJISESERI, a cabbage moth, SHIROICHIMONJIYOTOU a cabbage armyworm, a cabbage butterfly, and a turnip -- RAYAGA and a tobacco cutworm -- Smaller tea tortrix, Adoxyphyles sp., tea HAMAKI, peach SHINKUI, NASHIHIMESHINKUI, Apple Adoxophyes, Phyllonorycter ringoniella, a cotton-bowl worm, A tobacco BADDO worm, a European cone bowler, a fall army worm, Lepidoptera noxious insects, such as KODORINGA and a fall webworm, Nephotettix, A rice brown planthopper, a green peach aphid, an woolly

aphis, an ONSHITSU white fly, A tobacco white fly, a pear jumping plant lice, Stephanitis pyrioides, an Arrowhead scale, Hemiptera noxious insects, such as a mulberry kona scale insect, ruby ROUMUSHI, Diplonychus japonicus Vuillefroy, NAGAME, and a bedbug, A NIJUUYAHOSHI ten tow, a DOUGANE buoy buoy, a rice Ms. weevil, an ant MODOKI weevil, Beetles noxious insects, such as Aulacophora femoralis, a turnip fly, a Colorado beetle, Anoplophora malasiaca Thomson, Monochamus alternatus, a cone root worm, KOKOKUZOU, granum RIWIBIRU, and Tribolium castaneum, [0079] Liriomyza trifolii, a seed-corn fly, HESHIAN fly, a melon fruit fly, a CHICHUUKAI fruit fly, A muscid, the Stomoxys calcitrans, the Melophagus ovinus, a KISUJI warble botfly, a warble botfly, Diptera noxious insects, such as HITSUJIBAE, TSUETTSUEBAE, a red house mosquito, Aedes aegypti, and anopheles, Hymenoptera noxious insects, such as a turnip sawfly, MATSUNOKIHABACHI, and a chestnut sawfly, a MINAMIKIIRO thrip, Thysanoptera noxious insects, such as a Welsh onion thrip, a western flower thrips, a HIRAZUHANA thrip, and Scirtothrips dorsalis, Blattaria, such as Periplaneta fuliginosa, a Periplaneta japonica, and Blattella germanica, a locust, Oxya japonica, and a SABAKU rear spring supporter -- Orthoptera noxious insects, such as a grasshopper, -- The Isoptera noxious insects, such as Coptotermes formosanus, Reticulitermes, and the Taiwan termite, Mallophaga noxious insects, such as Isoptera noxious insects, such as a cat flea, Pulex irritans, and an oriental rat flea, a NIWATORIOO biting louse, and Bovicola bovis, Spider mites, such as the Siphunculata noxious insects, such as cow JIRAMI, swine JIRAMI, cow HOSOJIRAMI, and KEBUKAUSHIJIRAMI, a citrus red mite, a European red mite, a twospotted spider mite, and KANZAWAHADANI, [0080] FUSHIDANI, such as a mandarin orange rust mite, a fake pear rust mite, a tulip rust mite, and a tea NONAGA rust mite Acaridae, such as dust Acari, such as CHANO dust ticks and cyclamen dust ticks, Tyrophagus putrescentiae, and ROBINNEDANI, KYUUSENDANI, such as bee Acari, such as honeybee HEGIITADANI, Boophilus microplus, and Haemaphysalis longicornis Sacoptes scabiei, such as Sacoptes scabiei, a sweet potato root-knot nematode, KITANEKOBUSENCHUU, Crustaceans, such as mollusks, such as Nematoda, such as KITANEGUSARESENCHUU, a walnut meadow nematode, potato cyst SENCHUU, and a pine wood nematode, a SUKUMI apple guy, a slug, Acusta, and MISUJI eulota, and OKADANGOMUSHI, etc. are fried.

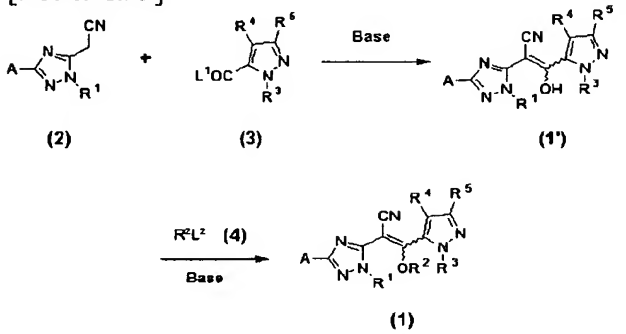
[0081] That is, this invention compound can prevent effectively the noxious insect and plant disease of Orthoptera, Hemiptera, Lepidoptera, beetles, Hymenoptera, Diptera, Isoptera, and tick Anoplura by low concentration. On the other hand, this invention compound contains the very useful compound which does not almost have a bad influence to the mammals, fishes, crustacean, and a useful insect.

[0082] this invention compound (1) is compoundable by the approach indicated to the scheme 1. That is, by making the carboxylic-acid derivative expressed with the cyano methyl triazole derivative expressed with a general formula (2), and a general formula (3) react under base existence, this invention compound (1) can compound some this invention compounds, and means that this invention compound is obtained by making this react with the compound expressed with a general formula (4) further. The compounds expressed with a general formula (4) are specifically acyl halide, benzoyl halide, alkyl halide, benzyl halide, alkoxy alkyl halide, alkoxy alkoxy alkyl halide, phenoxy alkyl halide, benzyloxy alkyl halide, alkyl sulfonate, benzene sulfonate, toluene sulfonate, alpha-halo ketones, and alpha-halo ester.

[Scheme 1]

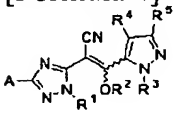
[0083]

[Formula 3]



[0084] A, R1, R2, R3, R4, and R5 in the [scheme 1 express the same semantics as the above, and L1 and L2 are a good leaving group, for example, a chlorine atom, a bromine atom, an iodine atom, C1 - C4 alkyl sulfonyl oxy-** benzene sulfonyl oxy-** toluenesulfonyloxy, 1-imidazolyl, 1-pyrazolyl, etc.] .

[0085] It may be more desirable for the approach indicated above to use a base. As a base used, alkali-metal alkoxides, such as a sodium ethoxide, sodium methoxide, and a tert-butoxy potassium Alkali-metal carbonates, such as alkali-metal hydroxides, such as a sodium hydroxide and a potassium hydroxide, a sodium carbonate, and potassium carbonate, Sodium hydride etc. is mentioned to lithium amide lists, such as organolithium compounds, such as organic bases, such as triethylamine, a pyridine, and DBU, and butyl lithium, a lithium JIISOPURO propyl amide, and a lithium bis-trimethylsilyl amide.
[0086] The reaction indicated above can be carried out to a reaction in an inactive solvent. As a solvent Lower alcohol, such as a methanol and ethanol Aromatic hydrocarbon, such as benzene and toluene, diethylether, a tetrahydrofuran, Ether, such as 1,4-dioxane, 1, and 2-dimethoxyethane and 1, and 2-diethoxy ethane, Ketones, such as an acetone, a methyl ethyl ketone, and methyl isobutyl ketone Halogenated hydrocarbon, such as a methylene chloride, chloroform, and 1,2-dichloroethane These mixed solvents etc. are mentioned to nitril, such as amides, such as dimethylformamide, dimethylacetamide and 1, and 3-dimethyl imidazolidinone, and an acetonitrile, and a dimethyl sulfoxide list. The mixed solvent of these solvents and water can also be used depending on the case, and a good result may be obtained by adding quarternary ammonium salt, such as a tetra--n-butyl ammonium star's picture, as a catalyst. It can be set as the temperature of -70 to 200 degrees C arbitration, and when using 0 degree C to 150 degrees C, or a solvent, the range of reaction temperature of the boiling point of -70 degrees C to a solvent is desirable. About 0.05 to 10 of a reaction substrateEq, the range of a base is 0.05 to 3Eq preferably.
[0087] Although it can obtain from reaction mixture with a conventional method, this invention compound can be separated and refined according to the purification method of arbitration, such as recrystallization and a column chromatography, when this invention compound needs to be refined.
[0088] In addition, in the case of the compound which has asymmetrical carbon in the compound included by this invention, an optical activity compound (+) object and the (-) object are included.
[0089] The example of the compound contained in this invention is shown in the 1st table. In addition, the cable address of front Naka shows the semantics of the following, respectively.
[0090] Me: -- a methyl group and Et: -- an ethyl group, Pr:propyl group, Bu:butyl, a Pen:pentyl radical, a Hex:hexyl group, and Hep: -- a heptyl radical, an Oct:octyl radical, a Non:nonyl radical, a Dec:decyl group, Ph:phenyl group, and n: -- normal, i:ISO, s:secondary, t:tertiary, and c:cyclo.
[0091] [The 1st table]
[0092]
[Formula 4]



[0093]
[Table 1]

A	R¹	R²	R³	R⁴	R⁵
Ph	Me	H	Me	H	H
Ph	Me	H	Me	Me	Cl
Ph	Me	H	Me	Et	Cl
Ph	Me	H	Me	Me	OMe
Ph	Me	H	Me	Et	OMe
Ph	Me	H	Me	OMe	Et
Ph	Me	H	Me	Me	Br
Ph	Me	H	Me	Br	Me
Ph	Me	H	Me	CF_3	H
Ph	Me	H	Me	H	CF_3
Ph	Me	H	Me	CF_3	Me
Ph	Me	H	Me	Me	CF_3
Ph	Me	H	Me	CF_3	Me
Ph	Me	COtBu	Me	Cl	Cl
Ph	Me	COtBu	Me	H	H
Ph	Me	COtBu	Me	Me	Cl
Ph	Me	COtBu	Me	Et	Cl
Ph	Me	COtBu	Me	Me	OMe
Ph	Me	COtBu	Me	Et	OMe
Ph	Me	COtBu	Me	OMe	Et
Ph	Me	COtBu	Me	Me	Br
Ph	Me	COtBu	Me	Br	Me
Ph	Me	COtBu	Me	CF_3	H

[0094]
[Table 2]

A	R¹	R²	R³	R⁴	R⁵
Ph	Me	COtBu	Me	H	CF_3
Ph	Me	COtBu	Me	CF_3	Me
Ph	Me	COtBu	Me	Me	CF_3
Ph	Me	COtBu	Me	CF_3	Me
Me	Me	COtBu	Me	Cl	Cl
Me	Me	COtBu	Me	Me	Me
Et	Me	COtBu	Me	Me	Cl
Et	Me	COtBu	Me	Me	Me
nPro	Me	COtBu	Me	Me	Cl
nPro	Me	COtBu	Me	Me	Me
iPro	Me	COtBu	Me	Me	Cl
iPro	Me	COtBu	Me	Me	Me
nBu	Me	COtBu	Me	Me	Cl
nBu	Me	COtBu	Me	Me	Me
iBu	Me	COtBu	Me	Me	Cl
iBu	Me	COtBu	Me	Me	Me
sBu	Me	COtBu	Me	Me	Cl
sBu	Me	COtBu	Me	Me	Me
tBu	Me	COtBu	Me	Me	Cl
tBu	Me	COtBu	Me	Me	Me
Ph	Et	COtBu	Me	Me	Me
Ph	nPro	COtBu	Me	Me	Me
Ph	iPro	COtBu	Me	Me	Me

[0095]
[Table 3]

A	R'	R"	R³	R⁴	R⁵
Ph	nBu	COtBu	Me	Me	Me
Ph	iBu	COtBu	Me	Me	Me
Ph	sBu	COtBu	Me	Me	Me
Ph	tBu	COtBu	Me	Me	Me
Ph	nPen	COtBu	Me	Me	Me
Ph	nOct	COtBu	Me	Me	Me
Ph	nNon	COtBu	Me	Me	Me
Ph	nDec	COtBu	Me	Me	Me
Ph	cPro	COtBu	Me	Me	Me
Ph	cPen	COtBu	Me	Me	Me
Ph	cHex	COtBu	Me	Me	Me
Ph	cHep	COtBu	Me	Me	Me
Ph	Me	COMe	Me	Me	Me
Ph	Me	COEt	Me	Me	Me
Ph	Me	Me	Me	Me	Me
Ph	Me	Et	Me	Me	Me
Ph	Me	SO_2Me	Me	Me	Me
Ph	Me	SO_2NMe_2	Me	Me	Me
Ph	Me	$CONMe_2$	Me	Me	Me
Ph	Me	CO-(2-Cl)-Ph	Me	Me	Me
Ph	Me	CO-(3-Cl)-Ph	Me	Me	Me
Ph	Me	CO-(4-Cl)-Ph	Me	Me	Me
Ph	Me	COtBu	Et	Me	Me

[0096]
[Table 4]

A	R'	R"	R³	R⁴	R⁵
Ph	Me	COtBu	nPro	Me	Me
Ph	Me	COtBu	iPro	Me	Me
Ph	Me	COtBu	nBu	Me	Me
Ph	Me	COtBu	iBu	Me	Me
Ph	Me	COtBu	sBu	Me	Me
Ph	Me	COtBu	tBu	Me	Me
Ph	Me	COtBu	Me	Et	Me
Ph	Me	COtBu	Me	nPro	Me
Ph	Me	COtBu	Me	iPro	Me
Ph	Me	COtBu	Me	nBu	Me
Ph	Me	COtBu	Me	iBu	Me
Ph	Me	COtBu	Me	sBu	Me
Ph	Me	COtBu	Me	tBu	Me
Ph	Me	COtBu	Me	Me	Et
Ph	Me	COtBu	Me	Me	nPro
Ph	Me	COtBu	Me	Me	iPro
Ph	Me	COtBu	Me	Me	nBu
Ph	Me	COtBu	Me	Me	iBu
Ph	Me	COtBu	Me	Me	sBu
Ph	Me	COtBu	Me	Me	tBu

[0097] In using this invention compound as an insect pest control agent, it can mix with a usually suitable solid support or liquid support, a surfactant, a penetrating agent, a spreader, a thickener, an antifreezing agent, a binder, a joint inhibitor, disintegrator, a stabilizing agent, etc. can be further added by request, and practical use can be presented with pharmaceutical preparation of the pharmaceutical form of arbitration, such as liquids and solutions, an emulsion, water dispersible powder, water soluble powders, granulation water dispersible powder, granulation water soluble powders, suspension, an opacifier, a SASUPO emulsion, microemulsion, powder material, a granule, and gel. Moreover, a water-soluble package object can also be enclosed and presented with the pharmaceutical preparation of the pharmaceutical form of the above-mentioned arbitration from a viewpoint of laborsaving and the improvement in safety.
[0098] As a solid support, mineral, such as natural mineral matter, such as a quartz, a kaolinite, pyrophyllite,

a sericite, talc, a bentonite, acid clay, attapulgite, a zeolite, and diatomaceous earth, a calcium carbonate, an ammonium sulfate, a sodium sulfate, and potassium chloride, synthetic silicic acid, and synthetic silicate are mentioned, for example.
[0099] As liquid support, vegetable oil and water, such as acid amides, such as ester, such as ketones, such as ether, such as aromatic hydrocarbon, such as alcohols, such as ethylene glycol, propylene glycol, and isopropanol, a xylene, alkylbenzene, and alkyl naphthalene, and butyl cellosolve, and a cyclohexanone, and gamma-butyrolactone, N-methyl pyrrolidone, and N-octyl pyrrolidone, soybean oil, rapeseed oil, cotton seed oil, and castor oil, are mentioned, for example.
[0100] These solid-states and liquid support may be used independently, or may use two or more sorts together.
[0101] As a surface active agent, for example Polyoxyethylene alkyl ether, Polyoxyethylene alkyl aryl ether, polyoxyethylene styryl phenyl ether, A polyoxyethylene polyoxypropylene block copolymer, polyoxyethylene fatty acid ester, The Nonion nature surfactants, such as a sorbitan fatty acid ester and polyoxyethylene sorbitan fatty acid ester, Alkyl sulfate, alkylbenzene sulfonates, a ligninsulfonic acid salt, Alkyl sulfo succinate, a naphthalene sulfonate, alkylnaphthalenesulfonate, The salt of the formalin condensate of a naphthalene sulfonic acid, the salt of the formalin condensate of an alkyl naphthalene sulfonic acid, A polyoxyethylene-alkyl-aryl-ether sulfuric acid and phosphate, a polyoxyethylene styryl phenyl ether sulfuric acid, and phosphate, Amphoteric surface active agents, such as cationic surface active agents, such as anionic surface active agents, such as a polycarboxylic acid salt and a polystyrene sulfonate salt, an alkylamine salt, and alkyl quarternary ammonium salt, an amino acid mold, and a betaine mold, are mentioned.
[0102] Although especially the content of these surfactants is not limited, its range of 0.05 - 20 weight section is usually desirable to the pharmaceutical preparation 100 weight section of this invention. Moreover, these surfactants may be used independently or may use two or more sorts together.
[0103] Moreover, when using this invention compound as agricultural chemicals, mixed use may be carried out if needed with the herbicide of other type, various insecticides, miticide, a nematicide, a germicide, a plant growth regulator, a synergist, fertilizer, a soil conditioner, etc. at the time of pharmaceutical preparation or spraying.
[0104] By carrying out mixed use with other agricultural chemicals or plant hormone especially, low-cost-izing by reduction of a use dose, expansion of the insect-killing spectrum by the synergism of mixed drugs, and the higher pest control effectiveness are expectable. Under the present circumstances, combination with two or more well-known agricultural chemicals is also possible to coincidence. As a class of agricultural chemicals which carry out mixed use with this invention compound, there is a compound indicated by the FARM Chemicals handbook (Farm Chemicals Handbook) 1994 edition, for example. Although it will be as follows if the generic name is illustrated concretely, they are not necessarily these things limited to seeing.
[0105] Germicide : Reed benzoRARU (acibenzolar), AMUPUROPIRUHOSU (ampropyfos), Anilazine (anilazine), azaconazole (azaconazole), BENARAKISHIRU (benalaxyl) AZOKI cis- -- fatty tuna -- a bottle (azoxystrobin) -- BENODANIRU (benodanil), BENOMIRU (benomyl), A BENZAMA krill (benzamacril), binapacryl (binapacryl), A biphenyl (biphenyl), Bitertanol (bitertanol), BETOKISAJIN (bethoxazine), Bordeaux mixture (bordeaux mixture), Blasticidin S (blasticidin-S), BUROMOKONAZORU (bromoconazole), A BUPIRI mate (bupirimate), a BUCHIO bait (buthiobate), A calcium polysulfide (calcium polysulfide), A KYAPUTA fall (captafol), captan (captan), Kappa oxy-chloride (copper oxychloride), Cull pro PAMIDO (carpropamid), cull vendor gin (carbendazim), Carboxin (carboxin), KINOMECHIONETO (chinomethionat), Clo bench AZON (chlobenthiazone), clo RUFENAZORU (chlorfenazol), Chloroneb (chloroneb), chlorothalonil (chlorothalonil), chlozolinate (chlozolinate), cufraneb (cufraneb), [0106] Cymoxanil (cymoxanil), cyproconazole (cyproconazol), SHIPUROJINIRU (cyprodinil), cyprofuram (cyprofuram), DEBAKARUBU (debacarb), dichlorophen (dichlorophen), JIKUROBUTORAZORU (diclobutrazol), JIKUROFURANIDO (diclhlofluanid), Dichlomedin (diclomedine), JIKURORAN (dicloran), JIETOFENKARUBU (diethofencarb), JIKUROSHIMETTO (diclocymet), JIFENOKONAZORU (difenoconazole), JIFURUME thorin (diflumetorim), dimethirimol (dimethirimol), [0107] A JIMETO morph (dimethomorph), JINIKONAZORU (diniconazole), JINIKONAZORU - M (diniconazole-M), JINOKAPPU (dinocap), A diphenylamine (diphenylamine), JIPIRI thione (dipyrithione), JITARIMUHOSU (ditalimfos), dithianon (dithianon), DODEMORUFU (dodemorph), DOJIN (dodine), DORAZOKUSORON (drazoxolon), EDEFENOHOSU (edifenphos), epoxyconazole (epoxiconazole), Etaconazole (etaconazole), ECHIRIMORU (ethirimol), ETORIJI anol (etridiazole), FAMOKISAZON (famoxadone), fenarimol (fenarimol), FEBUKONAZORU (febuconazole),

fenfuram (fenfuram), [0108] Fenpiclonil (fenpiclonil), FEN pro pidgin (fenpropidin), A FEMPUROPI morph (fenpropimorph), Foehn Ching (fentin), Fell Van (ferbam), ferimzone (ferimzone), Fluazinam (fluazinam), full dioxo nil (fludioxonil), Fluoroimide (fluoroimide), full Cucumaria NAZORU (fluquinconazole), Full SHIRAZORU (flusilazole), full sulfamide (flusulfamide), Flutolanil (flutolanil), a full thoria fall (flutriafol), Folpet (folpet), fosetyl-aluminum (fosetyl-aluminium), Fuberidazole (fuberidazole), furalaxyl (furalaxyl), FENAMIDON (fenamidone), FENHEKISAMIDO (fenhexamid), [0109] Guazatine (guazatine), hexachlorobenzene (hexachlorobenzene), Hexa kona ZORU (hexaconazole), hymexazol (hymexazol), Imazalil (imazalil), imibenconazole (imibenconazole), Imino KUTAJIN (iminoctadine), ipconazole (ipconazole), Iprobenfos (iprobenfos), iprodione (iprodione), isoprothiolane (isoprothiolane), IPUROBARIKARUBU (iprovalicarb), [0110] Kasugamycin (kasugamycin), KURESOKISHIMU-methyl (kresoxim-methyl), MANKAPPA (mancopper), MANKOZEBU (mancozeb), MANNEBU (maneb), MEPANIPIRIMU (mepanipyrim), MEPURONIRU (mepronil), metalaxyl (metalaxyl), METOKONAZORU (metconazole), MECHIRAMU (metiram), a METOMINO straw bottle (metominostrobin), micro swine nil (myclobutanil), nabam (nabam), a nickel screw (dimethyl dithiocarbamate) (nickel bis (dimethyldithiocarbamate)), nitro tar-isopropyl (nitrothal-isopropyl), nuarimol (nuarimol), OKUCHIRINON (octhilinone), ofurace (ofurace), oxadixyl (oxadixyl), oxycarboxin (oxycarboxin), OKIPOKONAZORU fumarate (oxpoconazole fumarate), [0111] PEFURAZOETO (pefurzoate), pen kona ZORU (penconazole), The Benxi kuron (pencycuron), free-wheel-plate RAIDO (phthalide), Piperalin (piperalin), polyoxin (polyoxins), Probenazole (probenazole), pro KURORAZU (prochloraz), Procymidone (procymidone), propamocarb hydrochloride (propamocarb hydrochloride), Propiconazole (propiconazole), propineb (propineb), PIRAZOHOSU (pyrazophos), pyrifenox (pyrifenox), Pilus meta-nil (pyrimethanil), PIROKYURON (pyroquilon), kino KISHIFEN (quinoxyfen), quintozene (quintozene), [0112] Sulfur (sulfur), SUPIROKISAMIN (spiroxamine), Tebuconazole (tebuconazole), tecnazen (tecnazene), Tetraconazole (tetraconazole), thiabendazole (thiabendazole), CHIFURUZAMIDO (thifluzamide), thiophanate-methyl (thiophanate-methyl), Thiram (thiram), torque ROHOSU-methyl (tolclofos-methyl), Tolyl FURANIDO (tolylfluanid), thoria JIMEHON (triadimefon), Thoria JIMENORU (toriadimenol), triazoxide (triazoxide), Tricyclazole (tricyclazole), tridemorph (tridemorph), Triflumizole (triflumizole), trifolin (triforine), Triticonazole (triticonazole), a validamycin (validamycin), vincrozoline (vinclozolin), a zineb (zineb), ziram (ziram), etc.

[0113] ** bacteria agent: Streptomycin (streptomycin), oxytetracycline (oxyterracycline), oxo-RINIKKU acid (oxolinic acid), etc.

[0114] Nematicide: ARUDOKISHIKARUBU (aldoxycarb), FOSUCHIAZETO (fosthiazate), Foss Choi Than (fosthietan), oxamyl (oxamyl), fenamiphos (fenamiphos), etc.

[0115] Miticide : Amitraz (amitraz), a BUROMOPUROPI rate (bromopropylate), CHINOMECHIONETO (chinomethionat), chlorobenzilate (chlorobezilate), Clofentezine (clofentezine), a SAIHEKI satin (cyhexatine), JIKOFORU (dicofol), the JIENO crawl (dienochlor), ETOKISAZORU (etoxazole), FENAZAKIN (fenazaquin), Fenbutatin oxide (fenbutatin oxide), Foehn proper thorin (fenpropathrin), The Foehn proxy mate (fenproximate), hull FEMPUROKKUSU (halfenprox), HEKISHICHIAZOKKUSU (hexythiazox), MIRUBEME cutin (milbemectin), Propargite (propargite), pyridaben (pyridaben), pilus midge FEN (pyrimidifen), tebufenpyrad (tebufenpyrad), etc.

[0116] Insecticide : Abamectin (abamectin), acephate (acephate), ASETAMI pyrid (acetamipirid), azinephosmethyl (azinphos-methyl), Bendiocarb (bendiocarb), Benfuracarb (benfuracarb), A BENSURU tap (bensultap), bifenthrin (bifenthrin), Buprofezin (buprofezin), BUTOKARUBOKISHIN (butocarboxim), Carbaryl (carbaryl), carbofuran (carbofuran), KARUBO sulfane (carbosulfan), cartap (cartap), Chlorphenapyl (chlorfenapyr), chlorpyrifos (chlorpyrifos), Chlorfenvinphos (chlorfenvinphos), KURORU fluazuron (chlorfluazuron), Clo thia NIJIN (clothianidin), chroma FENOJIDO (chromafenozide), Clo PIRIHOSU-methyl (chlorpyrifos-methyl), SHIFURU thorin (cyfluthrin), beta-SHIFURU thorin (beta-cyfluthrin), SHIPERUME thorin (cypermethrin), cyromazine (cyromazine), [0117] SHIHARO thorin (cyhalothrin), lambda-SHIHARO thorin (lambda-cyhalothrin), Delta METORIN (deltamethrin), JIAFENCHIURON (diafenthiuron), Diazinon (diazinon), JIAKURODEN (diacloden), JIFURUBENZURON (diflubenzuron), dimethylvinphos (dimethylvinphos), JIOFENORAN (diofenolan), a JISURU photon (disulfoton), Dimethoate (dimethoate), EPN, esfenvalerate (esfenvalerate), Ethiofencarb (ethiofencarb), an ECHIPU roll (ethiprole), Etofenprox (etofenprox), an etrimfos (etrimfos), Fenitrothion (fenitrothion), fenobucarb (fenobucarb), A phenoxy curve (fenoxycarb), Foehn proper thorin (fenpropathrin), Fenvalerate (fenvalerate), fipronil (fipronil), Full SHITORINETO (flucythrinate), full FENOKUSUURON (flufenoxuron), Full FEMPUROKKUSU (flufenprox), TAU-full BARINETO (tau-

fluvalinate), HONOHOSU (fonophos), FORUMETANETO (formetanate), formothion (formothion), hula thio KARUBU (furathiocarb), [0118] Halo FENOJIDO (halofenozide), hexa full MURON (hexaflumuron), Hydra methyl non (hydramethylnon), imidacloprid (imidacloprid), Isofenphos (isofenphos), in DOKISAKARUBU (indoxacarb), Isopropanal KARUBU (isoprocarb), isoxathion (isoxathion), RUFENUURON (lufenuron), a malathion (malathion), Metal DEHIDO (metaldehyde), meta-MIDOHOSU (methamidophos), Methidathion (methidathion), meta-KURIHOSU (methacrifos), Metal KARUBU (metalcarb), a meso mill (methomyl), Meso PUREN (methoprene), methoxychlor (methoxychlor), Methoxy FENOJIDO (methoxyfenozide), monocrotophos (monocrotophos), MUSUKARURE (muscalure), nitenpyram (nitenpyram), OMETOETO (omethoate), oxydemeton methyl (oxydemeton-methyl), oxamyl (oxamyl), [0119] Parathion (parathion) and parathion-methyl (parathion-methyl), Permethrin (permethrin), phenthoate (phenthoate), Phoxim (phoxim), HORETO (phorate), phosalone (phosalone), Phosmet (phosmet), phosphamidon (phosphamidon), Pilus MIKARUBU (pirimicarb), pilus MIHOSU-methyl (pirimiphos-methyl), Prophenophos (profenofos), pymetrozine (pymetrozine), Pyraclophos (pyraclofos), pyriproxifen (pyriproxyfen), A rotenone (rotenone), sulprofos (sulprofos), Silafluofen (silafluofen), SUPINOSADO (spinosad), Sulfo tetraethylpyrophosphate (sulfotep), tebufenozide (tebfenozide), Teflubenzuron (teflubenzuron), TEFURU thorin (tefluthrin), TERUBUHOSU (terbufos), tetra-chloro BINHOSU (tetrachlorvinphos), thio JIKARUBU (thiodicarb) and CHIAME -- an ibis -- sum (thiamethoxam) -- CHIOFA NOx (thiofanox), thiometon (thiometon), Torr fenpyrad (tolfenpyrad), tralomethrin (tralomethrin), Trichlorfon (trichlorfon), triazuron (triazuron), triflumuron (triflumuron), vamidothion (vamidothion), etc.

[0120] Although it is different with an application scene, a use stage, the use approach, cultivation crops, etc., generally about 0.005-50kg of hectare (ha) hits is suitable for the use dose of this invention compound as an amount of active principles.

[0121] Next, the example of combination of the pharmaceutical preparation in the case of using this invention compound concretely is shown. However, the examples of combination of this invention are not these things limited to seeing. In addition, in the following examples of combination, the "section" means the weight section.

[0122] [Water dispersible powder]

This invention compound 0.1 - 80 section solid support 5 - 98.9 section surfactant 1 - 10 section, others 0-As 5 sections and others, for example, a joint inhibitor, a stabilizing agent, etc. raise, and it is ******.

[0123] [Milk agent]

This invention compound 0.1 - 30 section liquid support 45 - 95 section surfactant 4.9 - 15 section, others A spreader, a stabilizing agent, etc. are mentioned as 0 - 10 section and others.

[0124] [Suspension]

This invention compound 0.1 - 70 section liquid support 15 - 98.89 section surfactant 1 - 12 section, others An antifreezing agent, a thickener, etc. are mentioned as 0.01 - 30 section and others.

[0125] [Granulation water dispersible powder]

This invention compound 0.1 - 90 section solid support 0 - 98.9 section surfactant 1 - 20 section, others A binder, a stabilizing agent, etc. are mentioned as 0 - 10 section and others.

[0126] [Liquid agent]

This invention compound 0.01 - 70 section liquid support The 20 - 99.99 section, others An antifreezing agent, a spreader, etc. are mentioned as 0 - 10 section and others.

[0127] [Grain agent]

This invention compound 0.01 - 80 section solid support The 10 - 99.99 section, others A binder, a stabilizing agent, etc. are mentioned as 0 - 10 section and others.

[0128] [Powder agent]

This invention compound 0.01 - 30 section solid support The 65 - 99.99 section, others As 0 - 5 section and others, for example, a drift inhibitor, a stabilizing agent, etc. are mentioned.

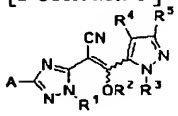
[0129] [Example of pharmaceutical preparation] Next, although the concrete example of pharmaceutical preparation of the pest control agent which makes this invention compound an active principle is shown, this invention is not limited to these.

[0130] In addition, in the following examples of pharmaceutical preparation, the "section" means the weight section.

[0131] [Example 1 of combination] Water-dispersible-powder this invention compound No.2 20 section pyrophyllite 76 section SORUPORU 5039 The two sections (mixture of a nonionic surfactant and an anionic surfactant: Toho Chemical Industry Co., Ltd. trade name)

Carplex #80D The two sections (synthetic water silicic acid: Shionogi& Co., Ltd. trade name)
Preferential grinding of the above is carried out to homogeneity, and it considers as water dispersible powder.
[0132] [the example 2 of combination] -- milk an agent -- this invention compound No.2 5 section xylene 75 section N-methyl pyrrolidone 15 section SORUPORU 2680 The five sections (mixture of a nonionic surfactant and an anionic surfactant: Toho Chemical Industry Co., Ltd. trade name)
It mixes to homogeneity and let the above be an emulsion.
[0133] [Example 3 of combination] Suspension (floor bull agent)
This invention compound No.2 25 section AGRISOL S-710 The ten sections (nonionic surfactant: Kao Corp. trade name)
RUNOKKUSU 1000C The 0.5 sections (anionic surfactant: Toho Chemical Industry Co., Ltd. trade name)
Xanthan gum 0.2 **** After mixing the 64.3 or more sections to homogeneity, wet grinding is carried out and it considers as suspension.
[0134]
[Example 4 of combination] Granulation water dispersible powder (dry floor bull agent)
This invention compound No.2 75 section high tenor NE-15 The five sections (anionic surfactant: Dai-Ichi Kogyo Seiyaku Co., Ltd. trade name)
BANIREKKUSU N The ten sections (anionic surfactant: Nippon Paper Industries Co., Ltd. trade name)
Carplex #80D The ten sections (synthetic water silicic acid: Shionogi& Co., Ltd. trade name)
After carrying out preferential grinding of the above to homogeneity, little water is added and stirring mixing is carried out, and it corns and dries with an extrusion type granulating machine, and considers as granulation water dispersible powder.
[0135] [the example 5 of combination] -- grain an agent -- this invention compound No.2 5 section bentonite 50 section talc After carrying out preferential grinding of the 45 or more sections to homogeneity, little water is added and stirring mixing is carried out, and it corns and dries with an extrusion type granulating machine, and considers as a granule.
[0136] [the example 6 of combination] -- powder an agent -- this invention compound No.2 3 section Carplex #80D The 0.5 sections (synthetic water silicic acid: Shionogi& Co., Ltd. trade name)
Kaolinite 95 section phosphoric-acid diisopropyl Preferential grinding of the 1.5 or more sections is carried out to homogeneity, and it considers as powder material.
[0137] On the occasion of use, the above-mentioned water dispersible powder, an emulsion, a floor bull agent, and granulation water dispersible powder are sprinkled so that it may dilute 50 to 20000 times with water and an active principle may become 0.005-50kg of 1ha (ha) hits.
[0138]
[Example] This invention is not limited by these although the synthetic example of this invention compound, the example of pharmaceutical preparation, and the example of a trial are concretely described as an example below.
[0139] [Synthetic example 1] 3- (1 and 4-dimethyl pyrazole-5-IRU)-3-hydroxy - 2 -(1-methyl-3-phenyl - 1, 2, 4-triazole-5-IRU)- Synthetic 5-cyano methyl-1-methyl-3-phenyl of acrylonitrile (compound No.1) - 1 Two, 4-triazoleg [0.5] and 1 and 4-dimethyl pyrazole-5-carbonyl chloride 0.48g was dissolved in tetrahydrofuran 50ml, and tertiary butoxy potassium 0.71g was added by ice-cooling-ization. After agitating at a room temperature overnight, the oily matter obtained by distilling off a solvent under reduced pressure was dissolved in 50ml of water, washing and a water layer were made into acidity by concentrated hydrochloric acid with toluene, and it dried with an extract, rinsing, and anhydrous sodium sulfate with ethyl acetate. Isopropyl ether washed the solid-state obtained by distilling off under reduced pressure of a solvent, and 0.46g of the mark purpose compounds was obtained. Melting point: 188 to 191 degree C [0140] [Synthetic example 2] 3- (1 and 4-dimethyl pyrazole-5-IRU) - (-- 1-methyl-3-phenyl - synthetic 3-(1, 4-dimethyl pyrazole-5-IRU)-3-hydroxy-2- (1-methyl-3-phenyl - 1 and 2 --) of 1, 2, and 4-triazole-5-IRU)-3-pivaloyloxy acrylonitrile (compound No.2) 4-triazole-5-IRU-acrylonitrile 0.3g was dissolved in chloroform 50ml, and triethylamine 0.09g was added, it ice-cooled, and pivaloyl chloride 0.11g was dropped. It agitated at the room temperature overnight. The reaction mixture was washed with water, the silica gel chromatography (chloroform / ethyl-acetate =3 / 1) refined the rough product obtained by distilling off the desiccation back with anhydrous sodium sulfate, and distilling off a solvent under reduced pressure, and 0.21g (3/2 mixture of E bodies and Z body) of the mark purpose compounds was obtained. Melting point: 130 to 133 degree C [0141] Although the structure and the melting point of this invention compound which were compounded according to said scheme or the above-mentioned synthetic example are shown in the 2nd

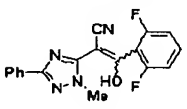
table, especially an unstated thing is the mixture of E bodies and Z body. In addition, the cable address of front Naka expresses the same semantics as the above.
[0142] [The 2nd table]
[0143]
[Formula 5]



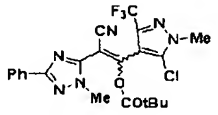
[0144]
[Table 5]

No.	A	R'	R"	R³	R⁴	R⁵	融点（℃）、異性体比
1	Ph	Me	H	Me	Me	H	188-191℃
2	Ph	Me	COtBu	Me	Me	H	130-133℃、3 / 1
3	Ph	Me	H	Me	H	Me	206-208℃
4	Ph	Me	COtBu	Me	H	Me	樹脂状、3 / 2
5	Ph	Me	H	Me	Cl	Me	158-161℃
6	Ph	Me	COtBu	Me	Cl	Me	樹脂状、3 / 1
7	Ph	Me	H	Me	Cl	Et	179-182℃
8	Ph	Me	COtBu	Me	Cl	Et	153-156℃、E体またはZ体
9	Ph	Me	H	Me	Me	Me	166-169℃
10	Ph	Me	COtBu	Me	Me	Me	樹脂状、1 / 1
11	Ph	Me	H	Me	OMe	Me	144-150℃
12	Ph	Me	COtBu	Me	OMe	Me	129-132℃、3 / 1
13	Ph	nHex	H	Me	Me	Me	85-88℃
14	Ph	nHex	COtBu	Me	Me	Me	樹脂状、5 / 1

[0145] [Example of a trial] Next, the usefulness as a pest control agent of this invention compound is concretely explained in the following examples of a trial. In addition, following compound A and following Compound B were used as a contrast compound. Compound A is compound No.2-1 [WO98 / given in the 2nd table of 42683 official reports], and Compound B is the derivative from compound No.4-1 of WO / the 4th table of 42683 official reports.
[0146]
[Formula 6]



A



B

[0147]
[Example 1 of a trial] The leaf of the insecticidal test kidney bean to a twospotted spider mite larva was placed using leaf punch on [of 3.0cm of diameters] the filter paper through which it cut off circularly and became wet on the styrol cup of 7cm of diameters. Ten twospotted spider mite larvae per one leaf were inoculated into this. the water into which the spreader went this invention compound indicated by the specification and 5% emulsion (water dispersible powder is offered as a sample 25% depending on a compound) of contrast compound A -- diluting -- 100 ppm concentration -- adjusting -- this drug solution -- every 2ml per styrol cup -- rotating type spraying -- a column -- **** spraying was ** carried out, and it held in the 25-degree C thermostatic chamber, and asked for the mortality after 96-hour progress from the following formula. In addition, the trial was performed by two constituency systems.
[0148]
[Equation 1]
Mortality ={number of dead insects/(number of number of dead insects + survival insects)} x100[0149]
Consequently, the following compounds showed 80% or more of mortality.
Compound No.: 2, 4, 5, 6, 9, 10, 13, 14.
On the other hand, the compound A used for contrast did not take effect at all by 100 ppm concentration.
[0150]

[Example 2 of a trial] The leaf of the insecticidal test kidney bean to a twospotted spider mite female imago was placed using leaf punch on [of 3.0cm of diameters] the filter paper through which it cut off circularly and became wet on the styrol cup of 7cm of diameters. The twospotted spider mite female imago was inoculated into this ten per one leaf. the water into which the spreader went this invention compound No.14 and 5% emulsion of the contrast compound B -- diluting -- 1.6-50 ppm concentration -- adjusting -- this drug solution -- every 2ml per styrol cup -- rotating type spraying -- a column -- **** spraying was ** carried out, and it held in the 25-degree C thermostatic chamber, and asked for the mortality after 48-hour progress from the formula of the example 1 of a trial. In addition, the trial was performed by two constituency systems. A result is shown in the 3rd table.

[0151]

[Table 6]

〔第３表〕

有効成分濃度 (ｐｐｍ)	死虫率（％） 化合物No.１４	化合物B
５０	１００	９０
２５	１００	５０
１２．５	９０	１０
６．３	９５	０
３．１	４０	
１．６	５	

[0152]

[Effect of the Invention] The compound of this invention shows the outstanding pest control activity.

[Translation done.]